CLAIMS

Sub B'

1. Method for forming an image by means of an image sensor with an active area (1) containing a plurality of pixels (10, 10', ...), comprising

   a) in n interrogation runs performed on a first subset (11) of pixels, where n is an integer and $n \geq 2$, resetting (21, 25) the first subset of pixels (11), exposing (22, 26) the first subset (11) of pixels and reading out (23, 27) the output value(s) ($\underline{P}_{long}^{(255)}$, $\underline{P}_{short}^{(255)}$) of the first subset (11) of pixels;

   b) combining said output values ($\underline{P}_{long}^{(255)}$, $\underline{P}_{short}^{(255)}$) into a first combined output value ($\underline{P}_{out}^{(255)}$);

   c) repeating steps a) and b) for at least one second subset (11') of pixels.

2. Method according to claim 1, wherein said subsets are rows (11, 11', ...), columns (12, 12', ...) or single pixels (10, 10', ...) of the image sensor.

A 3. Method according to ~~claim 1 or 2~~ claim 1 wherein prior to step a), the active area (1) of the image sensor is partitioned into subsets (11, 11', ...) with equal numbers (256) of pixels (10, 10', ...).

A 4. Method according to ~~one of the claims 1-3,~~ claim 1 wherein in step a), at least one of said output value(s) ($\underline{P}_{long}^{(255)}$) is/are stored (24, 24', ...).

A 5. Method according to ~~one of the claims 1-4,~~ claim 1 wherein steps a) and b) are repeated until each pixel (10, 10', ...) has been read out at least once.

6. Method according to ~~one of the claims 1-5~~ claim 1, wherein the processing of one subset (11) of pixels temporally overlaps with the processing of the following subset (11') of pixels.

7. Method according to ~~one of the claims 1-6~~ claim 1, wherein $n = 2$ for all subsets (11, 11', ...) of pixels.

8. Method according to claim 7, wherein in step a), a longer exposure (22, 22', ...) and a shorter exposure (26, 26', ...) are performed.

9. Method according to claim 8, wherein during said longer exposure (22) of one subset (11), steps b) are performed for all other subsets (11', ...).

10. Method according to ~~one of the claims 1-9~~ claim 1, wherein in step b), said output values ($P_1,...,P_n$) are combined into a combined output value (P_{out}) by means of a merging function ($f(x_1,...,x_n)$) which is truly monotonic, continuous and continuously differentiable in all said output values ($P_1,...,P_n$).

11. Method according to claim 10 and one of the claims 8 or 9, wherein said merging function ($f(x_1,x_2)$) has the following properties:

(i) Preference is given to the output value (x_1) obtained from the longer exposure (22, 22', ...) when said output values (x_1, x_2) or a combination of said output values ($(x_1 + x_2)/2$) lie beneath a given lower limit (x_{low});

(ii) Preference is given to the output value (x_2) obtained from the shorter exposure (26, 26', ...) when said output values (x_1, x_2) or a combination of said output values ($(x_1 + x_2)/2$) lie above a given upper limit (x_{up});

(iii) Said merging function ($f(x_1,x_2)$) increases truly monotonically in said output values (x_1, x_2) when said output values (x_1, x_2) lie between said lower limit (x_{low}) and said upper limit (x_{up}).

12. Method according to claim 11, wherein said merging function ($f(x_1,x_2)$) is defined by

$$f(x_1,x_2)=\sqrt{cx_1^2+(1-c)x_2^2} \quad \text{with} \quad c=(x_1-x_{up})/(x_{low}-x_{up})$$

for $x_{low} < x_1 < x_{up}$.

13. Method according to ~~one of the claims 1-12~~ claim 1, wherein said image sensor is an active pixel sensor (APS).

14. Method according to ~~one of the claims 1-13~~ claim 1, wherein said output values (P_{long}, P_{short}) are combined using a general-purpose digital computation unit, a dedicated digital or analog computation unit or a lookup table.

15. Image sensor for performing the method according to claim 1, comprising

an active area (1) containing a plurality of pixels (10, 10', ...), whereby at least two subsets (11, 11', ...) of pixels allow an individual interrogation;

means (2, 3) for individually interrogating subsets (11, 11', ...) of pixels;

means for combining output values ($\underline{P}_{long}^{(255)}$, $\underline{P}_{short}^{(255)}$) of said subsets (11, 11', ...) into combined output values ($\underline{P}_{out}^{(255)}$); and

means (6) for electrically outputting said combined output values ($\underline{P}_{out}^{(255)}$).

16. Image sensor according to claim 15, said image sensor being an active pixel sensor (APS).